# VOC's Alternate Test Methods 5/21/2007

Where are We?

Where are We going?

Alan Viets

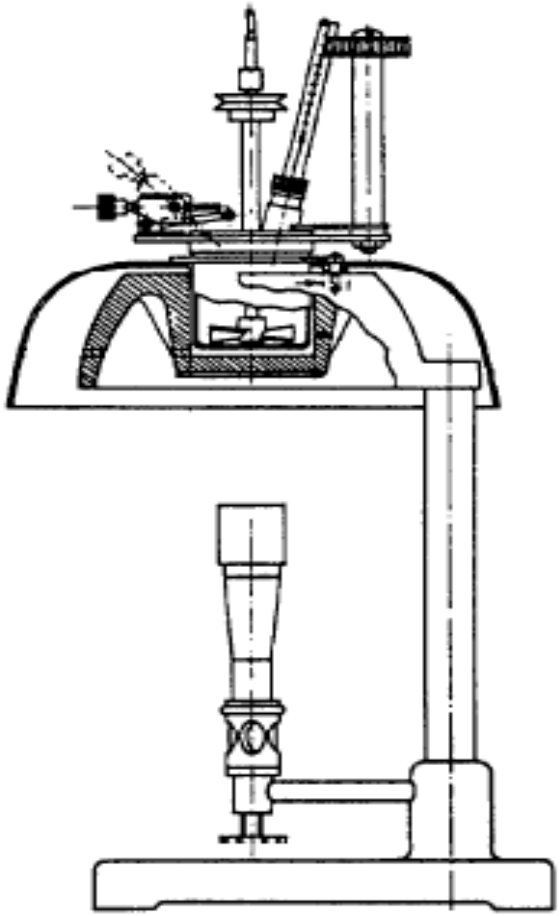
# WPHA/CLA Technical Team

- Arlean Rohde – ExxonMobil
- Doug Linscott – Dow AgroSciences
- Alan Viets – Bayer CropScience

# Background

- 31st year in Ag Industry
- Member of ISC, ASTM, DAPF, active with CIPAC and FAO
- Chairman of 1998 ASTM Symposium on Formulations and Applications
- Chaired the Physical Properties working group of the Spray Drift Task Force
- Worked 1994-1998 in the Bayer AG Formulation Development in Germany

Pensky-Martens Flash
Point Tester ASTM D93

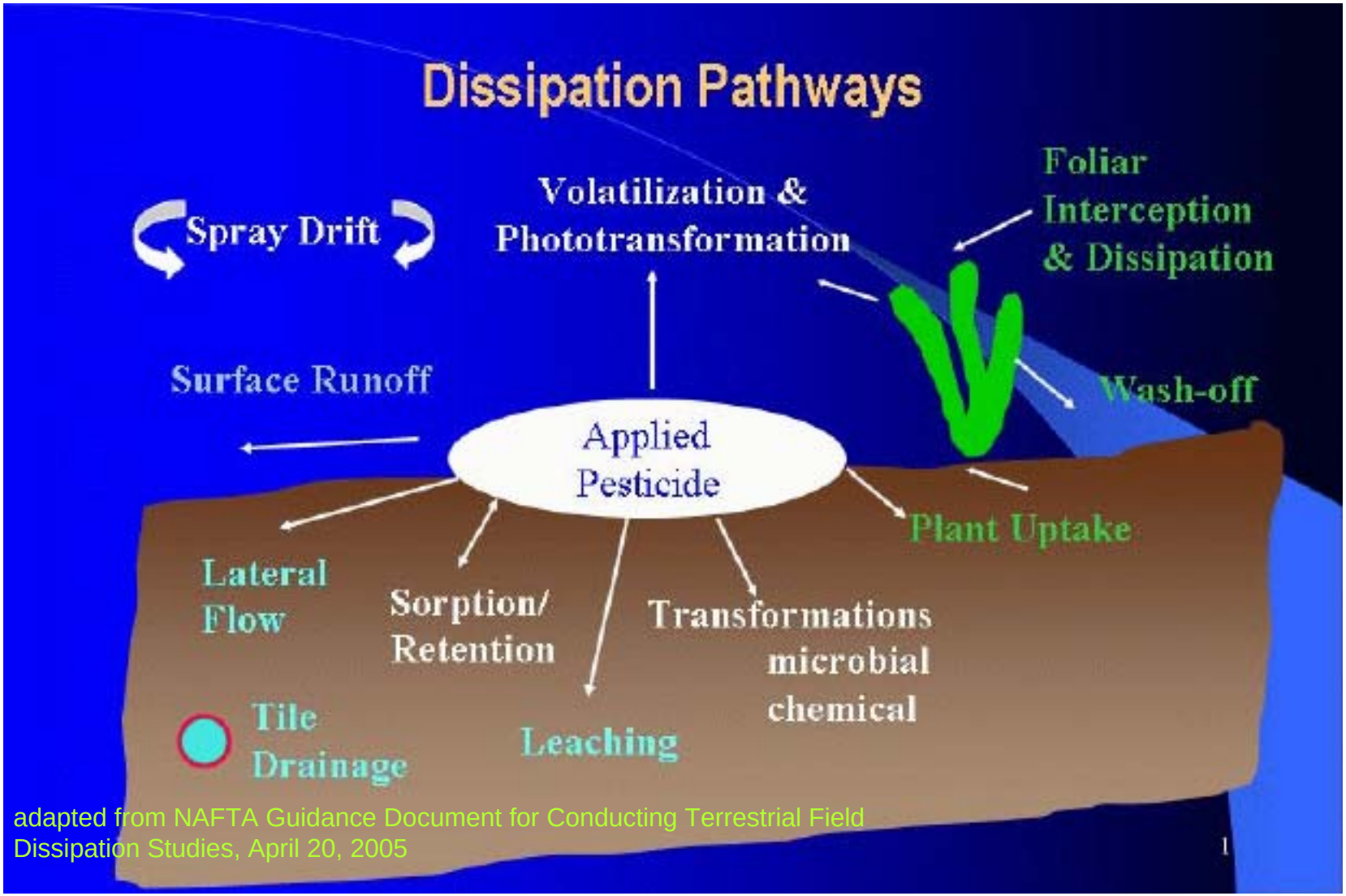


| | Experimental | |
|---|---|---|
| | mass loss % 115C | mass loss % 40C |
| | 80 Minutes | 480 minutes |
| Aromatic 200 | 100 | 44.61 |
| dodecylpyrrolidone | 4.88 | |
| octylpyrrolidone | 52.4 | |
| N,N dimethyl octanamide, decanamide | 99.4 | |
| N,N dimethyl decanamide | 65 | 5 |
| Propylene carbonate | 100 | 42.75 |
| | | |
| Cyclohexanone | 99.3 | 100 |
| N-methylpyrrolidone | 100 | |
| THFA | 100 | 100 |
| Propylene glycol methyl ether | 100 | |
| | | |
| Methyl Laurate | 100 | |
| propylene glycol | 100 | |
| Glycerin | 7.5 | |
| | | |
| | | |
| | | |

# Our Path Forward became Clear

Combine factors from soil and plant adsorption/absorption, kinetics, plant intercept, soil degradation and reactivity in the agricultural environment to model the potential to produce low level ozone.

# Key Environmental Fate Processes




adapted from NAFTA Guidance Document for Conducting Terrestrial Field Dissipation Studies, April 20, 2005

# The Most Important Solvent

- Without question aromatic solvents have always been the most widely used solvents for Agricultural Formulations.

- Solvents make EC’s the most efficacious if plant or insect penetration is important.

# Soil Adsorption/Absorption Round Robin

- This ASTM Round Robin is currently underway using high organic and low organic soil.
- Industry, Government and University Labs are participating in the USA and Europe.
- We should have results of this Round Robin in the fall of 2007.

| Round Robin Participants | Soil Round Robin | Plant Foliage Round Robin |
|---|---|---|
| Peter Baur, BCS Frankfurt | | X |
| Peter Green, UC Davis | X | (X) |
| Laura McConnell, USDA Beltsville, MD | X | (X) |
| Alan Viets, BCS Kansas City, MO | X | (X) |
| Dave Ferguson, Huntsman Corp. | X | X |
| Chip Collins, Stepan | X | |
| Arlean Rhode, Martin Krevalis - Exxon | X | X |
| Thomas Kroehl, BASF, DAPF, Germany | X | X |
| Greg Lindner, Uniqima | X | |
| Doug Linscott, Dow, soil, maybe foliage | X | (X) |
| Victor Chow, Syngenta USA, soil, likely foliage | X | (X) |
| Gunnar Fent, RLP AgroScience GmbH Institute for AgroEcology, Germany | X | (X) |

# Solvent Application Rate

- Historically Product application rates were seldom higher than 1 quart per acre.
- About half of the product by weight was solvent.
- Assuming 475 grams per acre, divided by 43,560 gives a solvent rate of .01 gram per square foot.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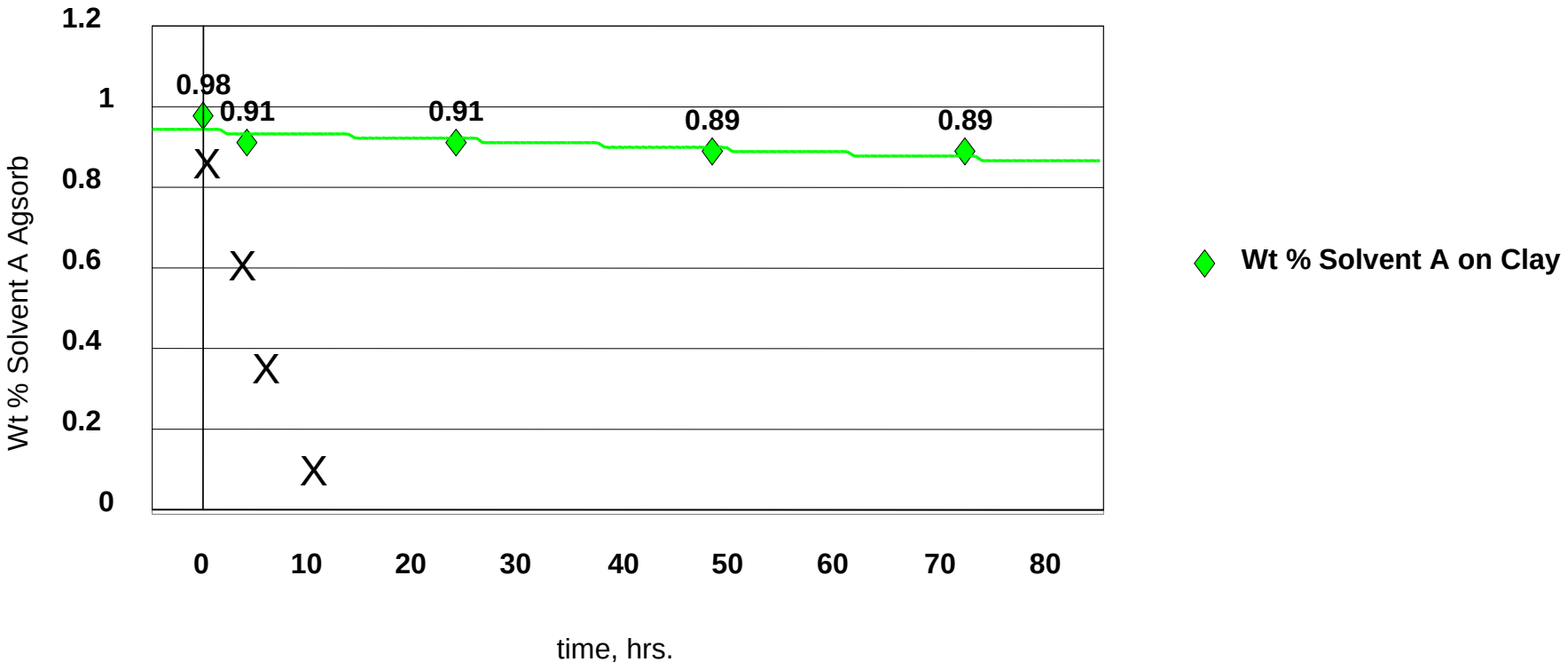
# Retention of Solvent A in Clay Granules, Preliminary Testing

## From Bayer EC Formulation

**Open Media Bottle @ 40°C Convection Oven**




Method: Solvent A.

Varian Star HPLC

Croft and Shafer

# Foliar Round Robin

- In the coming months we will be organizing a foliar round robin.
- Testing will be performed with the same blank EC in water applied to two different types of plant foliage: easily wet leaves like cotton and difficult to wet leaves like cereal grain.
- Testing will be done with no wind and 5mph at a temperature of 20C.

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[Note: minor content and formatting differences exist between this web version and the published version]

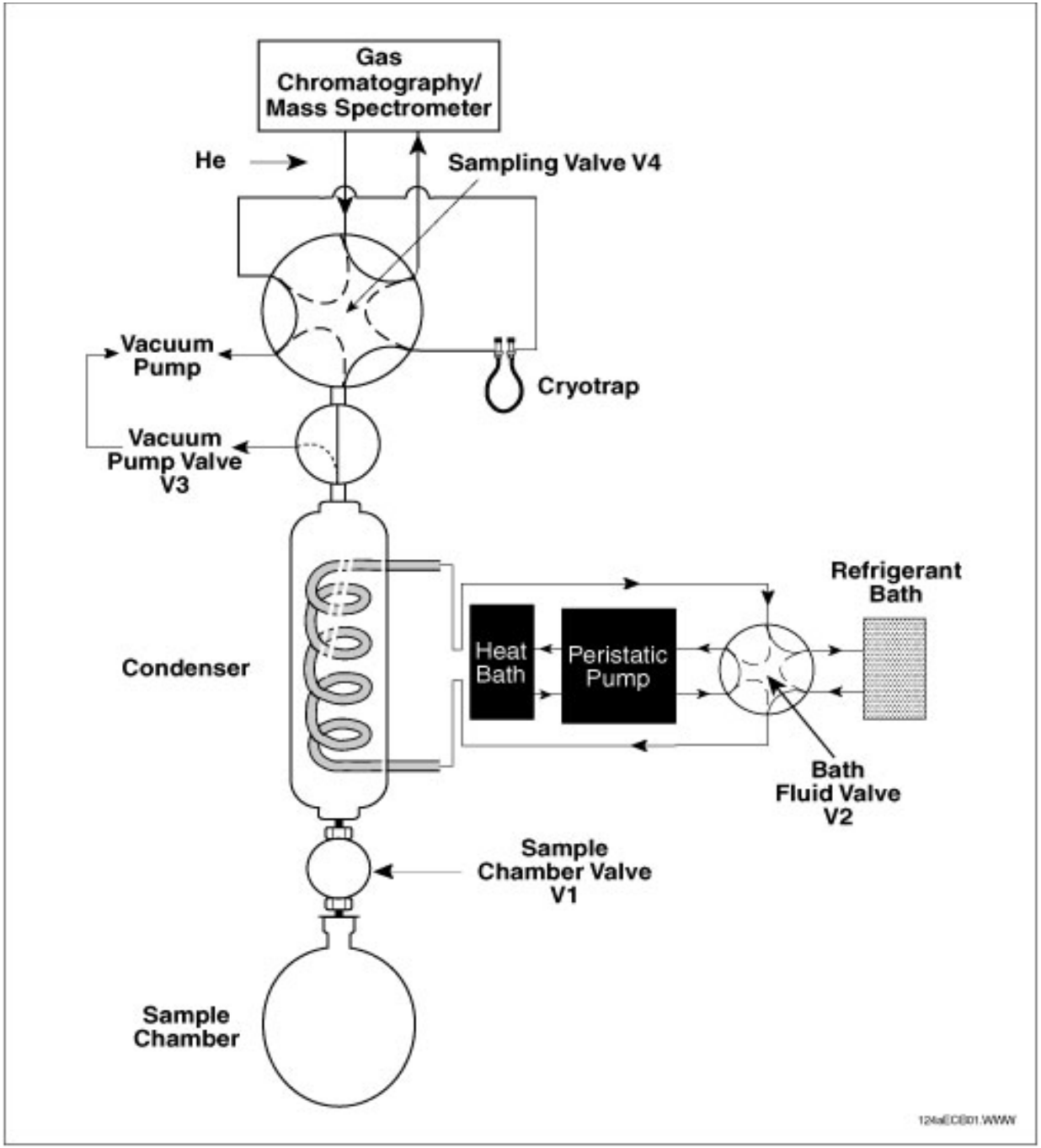


Figure 1. Vacuum distillation apparatus.

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DIVISION OF CHEMISTRY AND THE ENVIRONMENT
COMMISSION ON AGROCHEMICALS AND THE ENVIRONMENT*

# FOLIAR INTERCEPTION AND RETENTION VALUES AFTER PESTICIDE APPLICATION. A PROPOSAL FOR STANDARDIZED VALUES FOR ENVIRONMENTAL RISK ASSESSMENT

## (Technical Report)

*Prepared for publication by*
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# Current Status

- Vapor pressure exemptions are not acceptable to DPR for Ag products.
- We recommended establish a tiered approach to VOC testing.
- We asked DPR to allow ASTM to develop and test the suggested adsorption/absorption soil and foliar test methods.
- We plan to account for VOC adsorption/absorption when establishing atmospheric availability for a solvent in formulation based on the above methods.
- TGA results are predictable based on the composition of the Formulation.

# Conclusions

- California DPR accepted our proposal to work on a Solvent basis instead of a Formulation basis.  This allows us to do in depth studies on Solvents.
- VOC’s from Pesticides have been reduced due to DOT and Warehouse regulations.
- Alternative methods look promising and reflect reality better that the current TGA method.

# Once again, Our Path Forward

Combine factors from soil and plant adsorption/absorption, kinetics, plant intercept, soil degradation and reactivity in the California agricultural environment to model the potential to produce low level ozone.